

FORM PTO-1390
(REV. 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

327-090

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/031876

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/EP00/06390

06 July 2000 (6.07.00)

27 July 1999 (27.07.99)

TITLE OF INVENTION FOIL LEAK DETECTION CHAMBER *

APPLICANT(S) FOR DO/EO/US LEYBOLD VAKUUM GMBH, Rudi Widt, and Thomas Abelen

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

P2253, PCT/ISA/210, PCT/IB/301, PCT/IB/332, PCT/RO/101, PCT/IPEA401, PCT/IPEA/416

U.S. APPLICATION NO. (if known, see 37 CFR 1.57) Concurrently herewith 19/031 876	INTERNATIONAL APPLICATION NO PCT/EP00/06390	ATTORNEY'S DOCKET NUMBER 327-090
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21. <input type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a) (2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	
Total claims	-20 =		x \$18.00	\$	
Independent claims	-3 =		x \$80.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				\$	
				\$	
TOTAL OF ABOVE CALCULATIONS =				\$	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$	
SUBTOTAL =				\$	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	40.00
TOTAL FEES ENCLOSED =				\$	40.00
The PTO did not receive the following listed item(s) <u>Received \$780.00</u> <u>Cheq R.</u>				Amount to be refunded:	\$
				charged:	\$

- a. ☒ A check in the amount of \$ 40.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
 A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
 overpayment to Deposit Account No. 50-0289. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card
 information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

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37,283
 REGISTRATION NUMBER

1/pts

Foil Leak Detection Chamber

Foil leak detection chamber comprising two frames which are connected together in an articulated manner, foils which are mounted on said frames, a test chamber composed of the foils, a seal arranged between the frames and at least one bore hole, preferably several bore holes, in at least one of the two frames which can be connected to the inlet of a vacuum pump.

A foil leak detection chamber of this kind is known from DE-A-196 42 099. It is a component of a leak detection instrument which is equipped with the usual means (vacuum pumps, test gas sensor, controlling means etc.).

In the instance of the foil leak detection instruments of the kind affected here, the two frames are positioned substantially in the horizontal plane. The upper frame is equipped on the side opposing the articulation with a handle.

In order to open the test chamber created by the foils, the upper frame is lifted. A test sample which is to be inspected for the presence of leaks is then placed on the bottom foil. The test chamber is closed by lowering the upper frame to such an extent that the seal located between the frames ensures a vacuum-tight seal of the chamber.

Generally, the test samples will exhibit a volume necessitating more or less an expansion of the foils. For this, a force needs to be exerted opposing the lowering motion of the upper frame and which is only compensated when a sufficiently low pressure has been attained in the test chamber. Until this low pressure has been attained, the person operating the foil leak detection instrument needs to hold the upper frame. This time span is fairly long since the elastic walls of the test chamber give way initially, and because a low pressure of any significance is only created after the foils have made contact with the test sample, and the still remaining free volume has substantially attained its smallest volume.

In the instance of larger foil leak detection instruments of the kind affected here it is known to equip these with a spring, the force of which also opposes the closing motion of the upper frame. The presence of this spring is intended either for automatic opening of the upper frame during venting or at least for supporting the at that time the necessary opening motion. Owing to this second force opposing the closing motion, the time needed to hold the upper frame until the test chamber has been securely sealed, will be even longer.

It is the task of the present invention to improve the closing characteristics of a foil leak detection chamber of the kind affected here.

This task is solved through the characteristic features of the patent claims.

In that an edge zone is present which can be evacuated and which is independent from the actual test chamber, the required low pressure is created rapidly in the edge zone, holding the upper frame lowered on to the bottom frame in place. The pressure in the test chamber itself must at this time not yet have dropped significantly.

Further advantages and details of the present invention shall be explained with reference to the schematically depicted design examples of drawing figures 1 and 2. Depicted is in

- drawing figure 1 a partial sectional view through an implementation with a double seal and
- drawing figure 2 a partial sectional view through an implementation with a protrusion affecting one of the foils.

In the drawing figures the foil leak chamber is designated as 1, its two frames as 2, 3, the therein clamped foils as 4, 5, a handle provided at the upper frame 2 as 6, bores in one of the frames 2, 3 connectable to a vacuum pump as 7, said bores preferably being located in the bottom frame 3, the actual test chamber as 8, a joint preferably provided at the bottom foil 5 said joint being connectable to a vacuum pump as 9 and¹⁾ a test sample located in the test chamber 8 as 11.

In the implementation in accordance with drawing figure 1 the frames 2, 3 are equipped with a double seal. It comprises two concentric sealing rings 12, 13 and the

¹⁾ **Translator's note:** The German text states "und" here whereas "und" would be appropriate. Therefore "und" has been assumed for the translation.

intermediate space 14. Bores 7 open out into this intermediate space so that it forms the edge zone which can be evacuated.

Connected to the bores 7 and the connection 9 are one each vacuum pump 15, 16. After lowering the upper frame 2 on to the bottom frame 3, the evacuation process commences. Owing to the very small volume of the intermediate space 14, a low pressure is attained in said intermediate space very quickly, holding the upper frame 2 in place.

In the design example in accordance with drawing figure 2, only one sealing ring 18 is located between the frame 2, 3. In addition, the upper frame 2 is equipped with a circumferential protrusion 19 shaping the foil 4 clamped in the upper frame 2 in the direction of the bottom frame 3. The free circumferential rim 21 of the protrusion 19 is so positioned that the foils 4, 5 touch each other with upper frame 2 in the lowered state. Thus the desired evacuable edge zone 14 is created between the sealing lip 18 and the line of contact of the foils 4, 5.

In the implementation in accordance with drawing figure 2, only one vacuum pump 22 is provided. Its inlet is linked via the two lines 23, 24 to the bores 7 or the joint 9. Each of the lines 23, 24 is equipped with a valve 25, 26. Thus there exists the possibility of initially evacuating the evacuable edge zone 14 in order to generate a sufficiently low pressure in the edge zone 14. Thereafter, the test chamber 8 is evacuated.

A substantial advantage of the solution in accordance with drawing figure 2 is, that the frame 2 or 3 of an already finished foil leak chamber 1 can be retrofitted with the protrusion 19. In the instance of new foil leak chambers 1, the protrusion 19 is preferably provided by means of a contoured unitary component joined to one of the frames 2, 3.

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Foil Leak Detection Chamber**PATENT CLAIMS**

1. Foil leak detection chamber (1) comprising two frames (2, 3) which are connected together in an articulated manner, foils (4, 5) which are mounted on said frames, a test chamber (8) composed of the foils, a seal (12, 13, 18) arranged between the frames and at least one bore hole (7), preferably several bore holes, in at least one of the two frames (2, 3), which can be connected to the inlet of a vacuum pump (15, 16, 22), **wherein** an edge zone (14) is provided in which a vacuum can be created independently of the test chamber (8) and into which said bore holes (7) open out.
2. Chamber according to claim 1, **wherein** there are located between the frames (2, 3) two concentric seals (12, 13), the intermediate space of which forms the edge zone (14).
3. Chamber according to claim 1, **wherein** one of the frames (2, 3) is equipped with an inner circumferential protrusion (19), where the circumferential rim (21)

of the protrusion (19) is in contact with the related foil (4, 5) and is so positioned that the two foils (4, 5) touch each other when the frames (2, 3) rest on each other.

4. Chamber according to claim 3, **wherein** the protrusion (19) is designed by means of a contoured unitary component joined to one of the frames (2, 3).

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Foil Leak Detection Chamber**PATENT CLAIMS**

1 1. A foil detection chamber comprising:
2 a pair of frames connected together in an articulated manner;
3 a seal arranged between said frames;
4 a pair of foils mounted on said frames;
5 a test chamber partially defined by said foils;
6 at least one bore hole formed in at least one of said frames adapted for
7 connection with a vacuum pump;
8 wherein an edge zone is provided in which a vacuum can be created
9 independently of said test chamber and into which said at least one bore hole opens
10 out.

1 2. The foil detection chamber of claim 1, wherein located between said
2 frames are two concentric seals, an intermediate space of which forms said edge
3 zone.

1 3. The foil detection chamber of claim 1, wherein one of said frames is
2 equipped with an inner circumferential protrusion, wherein a circumferential rim of
3 said protrusion is in contact with at least one of said foils and is so positioned that
4 said foils touch each other when said frames rest on each other.

- 1 4. The foil detection chamber of claim 3, wherein said protrusion is provided
- 2 by a contoured unitary component joined to one of said frames.

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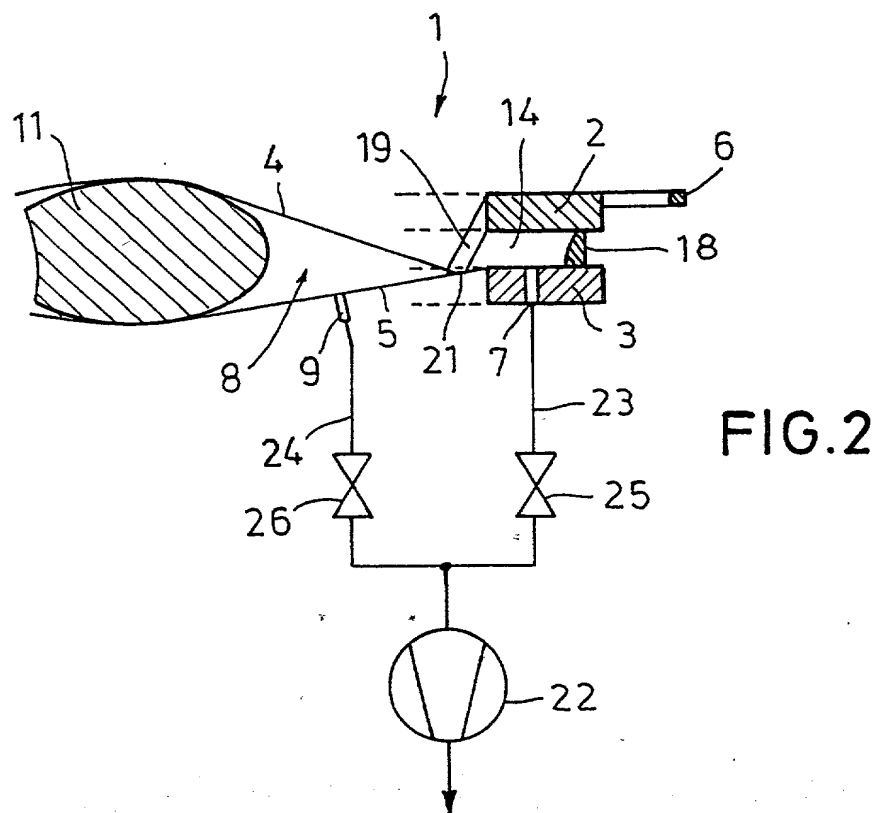
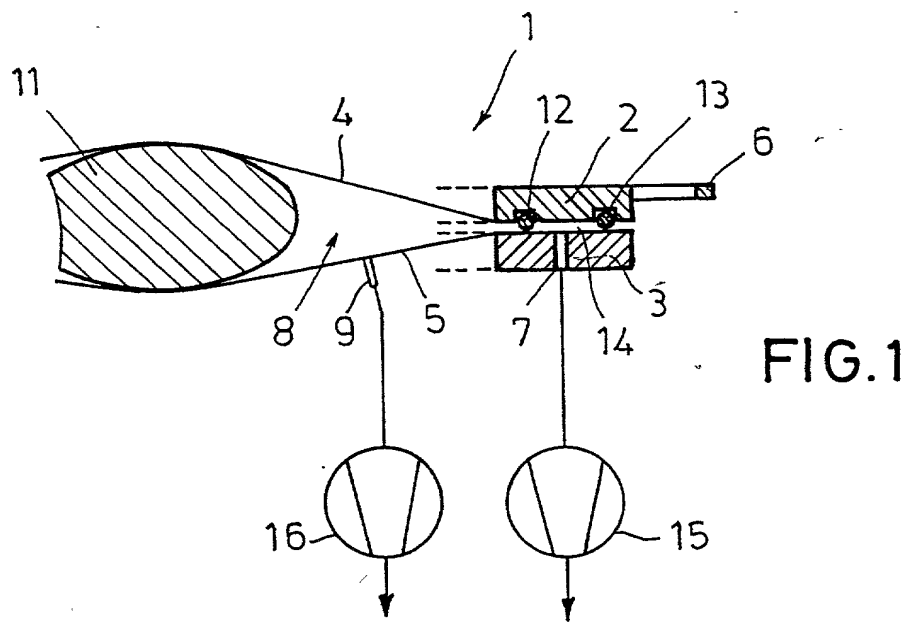
Foil Leak Detection Chamber

Abstract

The invention relates to a chamber for the detection of leaks on foils (1). Said chamber comprises two frames (2, 3) which are connected together in an articulated manner, foils (4, 5) which are mounted on said frames, a test chamber (8) composed of the foils, a seal (12, 13, 18) arranged between the frames and at least one bore hole (7), preferably several bore holes, in at least one of the two frames (2, 3), which can be connected to the inlet of a vacuum pump (15, 16, 22). In order to improve the chamber's closing features, said chamber comprises an edge zone (14) wherein a vacuum can be created independently of the test chamber (8) and into which said bore holes (7) open out.

(drawing figure 1)

10031876-012402
201210-92870001



Docket No.
327_090

Declaration and Power of Attorney for Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

FOIL LEAK DETECTION CHAMBER

the specification of which

(check one)

- ☐ is attached hereto.
- ☒ was filed on Concurrently Herewith as United States Application No. Not Assigned or PCT International Application Number PCT/EP00/06390 and was amended on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International Application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International Application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

<u>19935293.3</u> (Number)	<u>DE</u> (Country)	<u>July 27, 1999</u> (Day/Month/Year Filed)	<input type="checkbox"/>
<u> </u> (Number)	<u> </u> (Country)	<u> </u> (Day/Month/Year Filed)	<input type="checkbox"/>
<u> </u> (Number)	<u> </u> (Country)	<u> </u> (Day/Month/Year Filed)	<input type="checkbox"/>

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States Provisional Application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U.S.C. Section 120 of any United States Application(s), or Section 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International Application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C.F.R. Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

10031876-012402

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.
(List names and Registration Number)

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